

**WE CLAIM**

1. A method of selecting a routing datapath between an active datapath and a redundant datapath for a communication device, said method comprising:

- (i) Monitoring for a fault occurring in said active datapath and said redundant datapath;
- (ii) Upon detection of said fault, evaluating severity of said fault against a threshold; and if said severity of said fault exceeds said threshold:
  - (ii.1) If said fault is associated with said active datapath, switching said routing datapath from said active datapath to said redundant datapath; and
  - (ii.2) If said fault is associated with said redundant datapath, updating a health score associated with said redundant datapath with a score relating to said fault.

2. A method of selecting a routing datapath between an active datapath and a redundant datapath for a communication device as claimed in claim 1 wherein

said step (i) comprises determining if said fault is a first fault for said active datapath; and  
for said step (ii) if said fault is said first fault, setting said severity above said threshold.

3. A method of selecting a routing datapath between an active datapath and a redundant datapath for a communication device, said method comprising steps of:

- (i) Monitoring for a first fault occurring in said active datapath;
- (ii) Upon detection of said first fault, switching said routing datapath to said redundant datapath; and
- (iii) Monitoring for a subsequent fault occurring in said active datapath and said redundant datapath;
- (iv) Tracking said subsequent fault with any previous faults for active and redundant datapaths and evaluating said subsequent fault with said any previous faults against a threshold; and
- (v) If said threshold is exceeded and if said subsequent fault is associated with said active datapath, switching said routing datapath of said communications from active datapath to said redundant datapath.

4. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 3 wherein

said step (i) further comprises

(i.1) Monitoring said active datapath for faults in said active datapath and generating a first fault report upon detection of each of said faults in said active datapath; and

10 (i.2) Monitoring said redundant datapath for faults in said redundant datapath and generating a second fault report upon detection of each of said faults in said redundant datapath.

5. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 4 wherein

said step (iv) further comprises

(iv.1) Receiving said first fault report from a first monitoring module and updating a first fault report for said active datapath;

(iv.2) Receiving said second fault report from said second monitoring module and updating a second fault report for said redundant datapath; and

(iv.3) Generating a comparison value of said first and second fault reports to identify which of said active and redundant datapaths has a better health.

6. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 5 wherein:

earlier faults are cleared; and

said first and second fault reports are updated to remove said earlier faults.

7. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 6 wherein said first and second fault reports utilize separate data structures each comprising an entry for each element reporting said faults.

8. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 6 wherein:

data is sent through said active datapath and said redundant datapath at approximately the same time; and

upon switching of said routing datapath, causing said switching of said routing datapath at an egress point in said communication device.

9. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 8 wherein said egress point is an egress line card in said communication device.

10. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 9 wherein

said steps (i) and (iii) are conducted by a fault detection unit receiving fault messages from a driver associated with a physical location in said communication device related to said fault messages.

11. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 10 wherein

said fault detection unit debounces said fault messages and reports said fault messages to a fault analysis unit associated with said physical location.

12. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 11 wherein

said fault detection unit utilizes one state machine for each of said fault messages to debounce said fault messages.

13. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 11 wherein said fault analysis unit performs said step (ii).

14. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 12 wherein said fault detection unit utilizes global data to store information relating to each of said fault messages.

15. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 14 wherein for a given fault message, said fault detection unit accesses said global data to allow initiation of a state machine associated with said given fault.

16. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 15 wherein

for said step (iii) said fault detection unit advises a fabric selection unit of said subsequent fault; and

said fabric selection unit performs said step (iv).

17. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 16 wherein said fabric selection unit is located at a central location in said communication device.

18. A method of selecting a routing datapath between an active datapath and a redundant datapath as claimed in claim 17 wherein said fabric selection unit assigns one of a plurality of fault weight values to each of said subsequent fault and said any previous faults.

- 10 19. A method of selecting a routing datapath between an active datapath and a redundant datapath of a communication device, said method comprising:
- (i) Monitoring for an event occurring in either said active datapath or said redundant datapath;
  - (ii) Upon detection of said event
    - 20 (ii.1) Updating a first status associated with a first set of components in said active datapath if said event occurred in said active datapath; and
    - (ii.2) Updating a second status associated with a second set of components in said redundant datapath if said event occurred in said redundant datapath;
  - (iii) Performing an evaluation said first status and said second status against at least one failure threshold; and
  - (iv) Selecting said routing datapath according to said evaluation.

20 20. A switch providing a routing datapath between a first datapath in a first fabric and a second datapath in a second fabric, said switch comprising

said first datapath being an active datapath;

said second datapath being a redundant datapath for said active datapath;

a fault detection unit associated with said first and second datapaths;

a fault analysis unit associated with said fault detection unit;

a fabric selection unit associated with said fault analysis unit,

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said fault detection system monitors for a fault occurring in said active datapath and said redundant datapath;

Upon detection of said fault, said fault analysis unit evaluates severity of said fault against a threshold; and

if said severity of said fault exceeds said threshold

if said fault is associated with said active datapath, said fabric selection unit switches said routing datapath from said active datapath to said redundant datapath.

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21. A switch providing a routing datapath between a first datapath in a first fabric and a second datapath in a second fabric, said switch comprising

said first datapath being an active datapath;

said second datapath being a redundant datapath for said active datapath;

a fault detection unit associated with said first and second datapaths;

a fault analysis unit associated with said fault detection unit; and

a fabric selection unit associated with said fault analysis unit,

wherein

said fault detection unit monitors for a first fault occurring in said active datapath;

upon detection of said first fault, said fabric selection unit switches said routing datapath to said redundant datapath;

said fault detection unit monitors for a subsequent fault occurring in said active datapath and said redundant datapath;

said fault analysis unit tracks and reports said subsequent fault to said fabric selection unit;

said fabric selection unit evaluates said subsequent fault with any previous faults for active and redundant datapaths and evaluates said subsequent fault with said any previous faults against a threshold; and

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if said threshold is exceeded and if said subsequent fault is associated with said active datapath, said fabric selection unit switches said routing datapath from active datapath to said redundant datapath.

22. A switch as claimed in claim 21 wherein

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monitors said redundant datapath for faults in said redundant datapath and and advises said fault analysis unit of said faults in said active datapath,

and

said fault analysis unit also

generates a second fault report of said faults in said redundant datapath and provides same to said fabric selection unit.

23. A switch as claimed in claim 22 wherein said fabric selection unit also generates a comparison value of said first and second fault reports to identify which of said active and redundant datapaths has a better health.